INSTALLATION MANUAL

Single Station Thermal Printer

Model: BTP-2002NP

- This printer has been manufactured and branded for ORIENT Technologies B.V. by Shandong New Beiyang Information Technology Co., Ltd.
- Design and specifications are subject to change without notice. Ask your supplier for technical specifications before purchase and/or use.
- Whenever in doubt about safety issues that might arise from using this product, please contact the supplier immediately for assistance.

Declarations

Changes without notice

Information in this document is subject to change without notice. ORIENT Technologies bv (hereinafter referred to as "ORIENT Technologies") and SHANDONG NEW BEIYANG INFORMATION TECHNOLOGY CO., LTD. (hereinafter referred to as "SNBC") reserves the right to improve products as new technology, components, software, and firmware become available. If users need further data about this product or have any doubt about safety issues that might arise from using it, please feel free to contact ORIENT Technologies, SNBC or your local agents.

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Warnings and Cautions in this manual

Warning: Items shall be strictly followed to avoid damages to body and equipment.
Caution: Items with important information and prompts for operating the printer.

Certifications

The quality control system of SNBC has been approved of the following certification.

(DNV)ISO9001:2000

The environmental control system of SNBC has been approved of the following certification.

(DNV)ISO14001:2004

BTP-2002NP has been approved of the following certification.

WEEE directive 2002/96/EC

ORIENT Technologies bv is complying with all aspects of the European Union's WEEE directive 2002/96/EC. All the customers and end-users can send the products that have reached the end of their lifes and are to be recycled, to ORIENT Technologies bv. ORIENT Technologies bv will take care of the recycling of these products in an environmentally responsible manner in accordance with WEEE directive.

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CONTENT

GENERAL SAFETY INFORMATION **2**

1 PARTS IDENTIFICATIONS **3**

2 SETTING UP THE PRINTER **5**

2.1 Unpacking **5**
2.2 Connecting the Cables **5**
2.2.1 Interface Connector 6
2.2.2 Cash Drawer Connector 8
2.3 Loading the Paper Roll **8**

3 SWITCH, BUTTON AND LED **11**

3.1 Power Switch **11**
3.2 Feed Button **11**
3.3 LED **11**

4 SELF-TEST **12**

5 HEXADECIMAL DUMP **12**

6 SPECIFICATIONS **13**

6.1 General Specifications **13**
6.2 Auto Cutter Specifications **14**
6.3 Interface **14**
6.4 Electric Parameters of the Power Supply **14**
6.5 Environmental Conditions **14**
6.6 Reliability **15**
6.7 Black Mark Specifications **15**
6.8 Overall Dimension **16**

7 FEED BUTTON CONFIGURATION **16**

General Safety Information

Before installing and using the printer, please read the following items carefully.

Safety Labels

Don't touch the cutter and tear bar of printer.

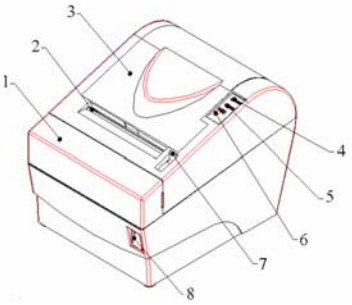
The print head is a thermal element and it is at high temperature during printing or just after operation, therefore please do not touch it and its peripherals for safety reasons.

The thermal head is an ESD-sensitive device. To prevent damage, do not touch either its printing part or connecting parts.

Caution

- Install the printer on a flat and stable place.
- Reserve adequate space around the printer so that convenient operation and maintenance can be performed.
- Keep the printer away from water source.
- Do not use or store the printer in a place exposed to heat of fire, moisture, serious pollution and direct sunlight.
- Do not place the printer on a place exposed to vibration or impact.
- No dew condensation is allowed to the printer. In case of such condensation, do not turn on the power until the condensation has completely gone away.
- Connect the AC adapter to an appropriate grounded mains outlet. Avoid sharing the mains outlet with large power motors and other devices that may cause the fluctuation in voltage.
- Disconnect the AC adapter when the printer is not used for a long time.
- The socket-outlet shall be installed near the equipment and shall be easily accessible.
- Don't spill water or other materials on the printer. If this happens, turn off the power immediately.
- Do not allow the printer to start printing when there is no printer paper installed, otherwise the print head and platen roller might be damaged.
- To ensure quality print and normal lifetime, use recommended or good quality printer paper.
- Shut down the printer when connecting or disconnecting interfaces connectors to avoid damage to the control board.
- Set the print darkness to a lower grade as long as the print quality is acceptable. This will help to lengthen the print head life-time.
- The printer should only be disassembled or repaired by a technician, who is certified by the manufacturer or by ORIENT Technologies bv.
- Keep this manual safe and at hand for ready reference.

Parts Identifications



1— Cutter cover

2— Tear bar

3— Printer top cover

4— Power LED

Indicating power status (ON/OFF).

5— Error LED

The red LED indicates basic information about the status of the printer. When the LED is off, the printer is operating normally. A flashing red LED means the printer needs operator assistance (such as paper end).

6— Feed button

Under normal status (no error), press it to feed paper. To feed long lengths of paper, press the key continuously.

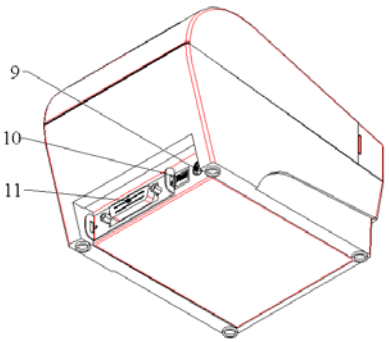
7— Top cover latch

8— Power switch

Turning on/off the power for the printer.

"O"-power is turned off;

"—"-power is turned on.



9— Power connector

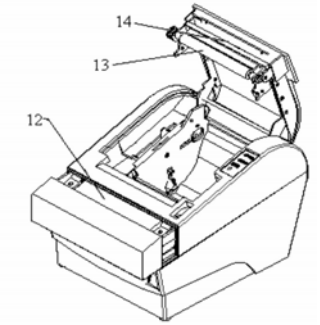
10—Cash drawer connector

11—Communication interface

12—Cutter acting blade

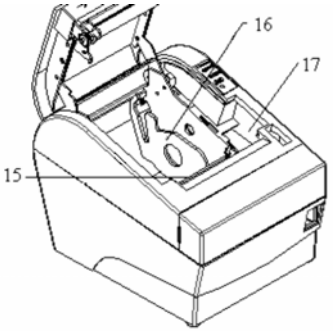
13—Printer platen

14—Cutter fixed blade



15—Paper end sensor

For continuous paper, this sensor is used to detect whether the paper roll has run out.



16—Paper-width-adjust module

There are 4 long slots at the base of paper holder, putting the paper-width-adjust module in different slot will allow the printer to use different width papers listed as follows:80±0.5 mm, 76±0.5 mm, 69.5± 0.5 mm, 57.5±0.5 mm. Removing the paper-width-adjust module will allow a paper width 82.5 ±0.5mm.

Caution: Paper-width-adjust module is an indispensable part of printer and should be kept safely.

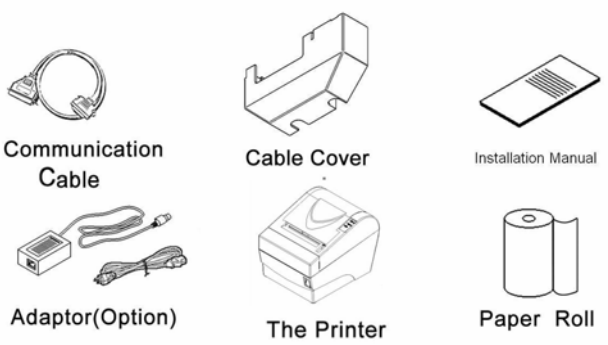
17—Top cover position sensor

The sensor is used to detect whether the top cover is closed or not.

Setting UP the Printer

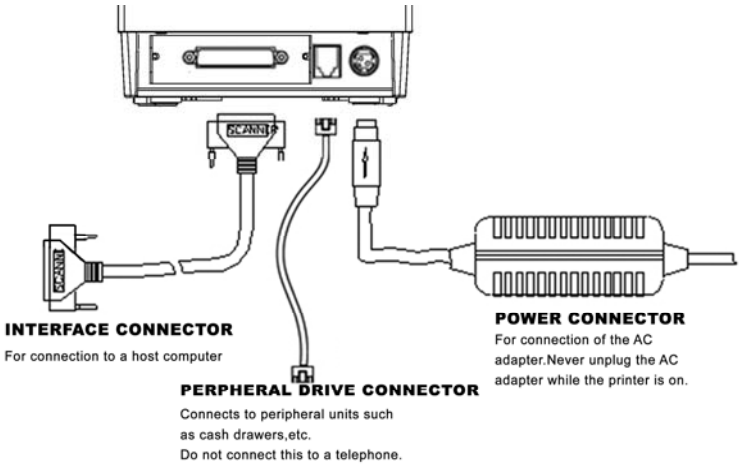
2.1 Unpacking

Your printer box should include these items. If any items are damaged or missing, please contact your dealer for assistance.

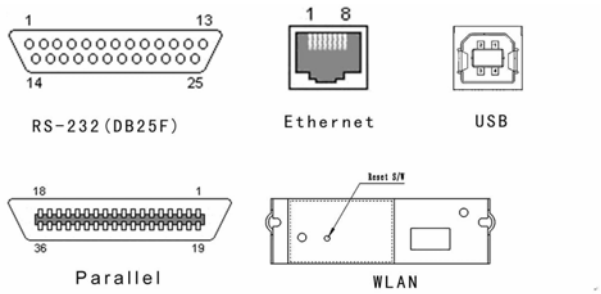


2.2 Connecting the Cables

You can connect up the cables required for printing to the printer. They all connect to the connector panel on the back printer, which is shown below:
Before connecting any of the cables, make sure that both the printer and the computer are turned off.


INTERFACE CONNECTOR
For connection to a host computer
POWER CONNECTOR
For connection of the AC adapter.Never unplug the AC adapter while the printer is on.
PERPHERAL DRIVE CONNECTOR
Connects to peripheral units such as cash drawers,etc.
Do not connect this to a telephone.

2.2.1 Interface Connector



RS-232 serial interface (DB25F)

Pin	Signal name	Signal direction	Function
1	FG	—	Frame ground
2	TXD	Output	Transmit data
3	RXD	Input	Receive data
4	RTS	Output	Same as DTR signal
6	DSR	Input	This signal indicates whether the host computer can receive data. SPACE indicates that the host computer can receive data, and MARK indicates that the host computer cannot receive data. When DTR/DSR control is selected, the printer transmits data after confirming this signal (except when transmitting data by DLE EOT, and GS a). When XON/XOFF control is selected, the printer does not check this signal.
7	SG	—	Signal ground
20	DTR	Output	1) When DTR/DSR control is selected, this signal indicates whether the printer is busy. SPACE indicates that the printer is ready to receive data, and MARK indicates that the printer is busy. 2) When XON/XOFF control is selected: The signal acts the same as when DTR/DSR control is selected.

Parallel interface

Pin	Source	Function	Pin	Source	Function
1	H	NStrobe	19		Signal Ground (nStrobe)
2	H	Data 0 (Least Significant Bit)	20		Signal Ground (Data 1)
3	H	Data 1	21		Signal Ground (Data 2)
4	H	Data 2	22		Signal Ground (Data 3)
5	H	Data 3	23		Signal Ground (Data 4)
6	H	Data 4	24		Signal Ground (Data 5)
7	H	Data 5	25		Signal Ground (Data 6)
8	H	Data 6	26		Signal Ground (Data 7)
9	H	Data 7 (Most Significant Bit)	27		Signal Ground (Data 8)
10	P	NAck	28		Signal Ground (PError, Select, and nAck)
11	P	Busy	29		Signal Ground (Busy and nFault)
12	P	Perror	30		Signal Ground (nAutoFd, nSelctIn, and nInit)
13	P	Select	31	H	NInit
14	H	nAutoFd	32	P	NFault
15		Not defined	33		Not defined
16		Logic Gnd	34		Not defined
17		Chassis Gnd	35		Not defined
18	P	Peripheral Logic High	36	H	nSelectIn

Ethernet

Pin Number	Signal Name	Function
1	TX+	Output Data+
2	TX-	Output Data -
3	RX+	Input Data+
4	NC	
5	NC	
6	RX-	Input Data -
7	NC	
8	NC	

USB interface

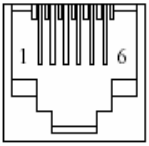
Pin Number	Signal Name	Function
1	VBUS	+5V
2	DATA-	Printer data transmit line minus
3	DATA+	Printer data transmit line plus
4	GND	Ground

2.2.2 Cash Drawer Connector

The drawer kick-out drive pulses are generated by command. The host can retrieve the status of the drawer by using the DLE EOT, GS a, or GS r commands.

1) Pin assignments:

Pin Number	Signal Name	Function
1	Frame GND	--
2	Drawer kick-out drive signal 1	Output Data
3	Drawer open/close signal	Input Data
4	+24 V	--
5	Drawer kick-out drive signal 2	Output Data
6	Signal GND	--



2) Connector model:

Printer side: DuoYuan DY126-6P6C or equivalent

User side: 6-position 6-contact (RJ11 telephone jack)

3) Drawer kick-out drive signal

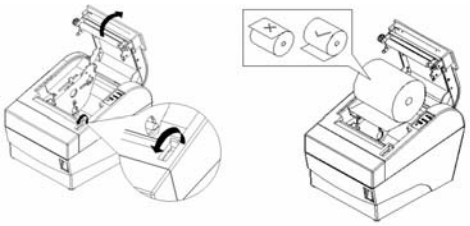
Output signal: Output voltage: Approximately 24V

Output current: 1A or less

2.3 Loading the Paper Roll

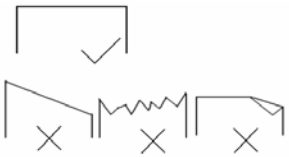
Note: Be sure to use paper rolls that meet the specifications. Do not use paper rolls that have the paper glued to the core because the printer cannot detect the paper end correctly. (Turn off power switch).

1) Turn off the printer.
2) Open the printer top cover, as in following figure.
3) Put the paper roll into the paper holder. See figure below.



Caution:

- Adjust the paper width by adjusting the paper-width-adjust module according to the paper type used.
- Make sure that the paper roll is cut according to the requirement below before loading:

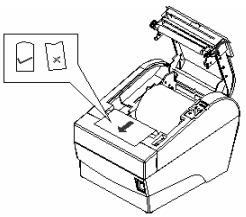


- Make sure that the heat sensitive side of paper faces the print head and the rolling direction of paper meets the requirements.
- The paper roll should be kept from being loose. Or it may cause paper jam or other malfunction.
- The paper roll should be balanced in the paper holder and not be inclined because it can affect paper auto loading and printing.

4) Pull the end of the paper roll out up to the end of the top cover, and close the printer cover. See figure below.

Caution:

- Both sides of the printer cover must be pressed down completely, fail to do so will influence the normal operation of the printer.
- The edge of paper should not leave at the paper exit as shown in the above figure.

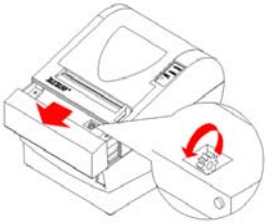


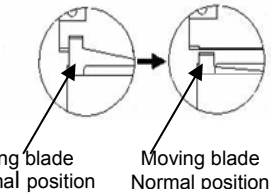
5) Tear off the surplus portion of paper by using the tear bar.

Caution:

While encountering cutter malfunction due to paper jam or unexpected power loss, do not open the top cover of the printer by force since the moving blade of the cutter might blocked the cover. Failing to do so might damage the moving blade of the cutter. In case the moving blade is blocking the cover of the printer, please follow the instructions below to solve the problem.

1) Switch off the printer and disconnect the power adapter from the printer.
2) Remove the cutter cover as shown in figure below, which will expose a small wheel-knob.
3) If the auto cutter works in full cut mode, turn the wheel-knob counter-clockwise as shown in figure below (turn it inversely when partial cut) while observing its movement through the paper exit, do not stop turning until the moving blade is completely separated from the stationary blade. Then open the top cover to clear paper jam or such the like.





Caution 1: Usually, at the beginning of the knob being turned, the moving blade seems to move very slowly. However, it's moving. Therefore, keep turning while carefully observing its movement.

Caution 2: In case of being unable to turn the knob counter-clockwise as shown in figure above, turn it clockwise.

Switch, Button and LED

3.1 Power Switch

The power button (a rocker switch) turns the power on or off.

Note: Turn the power on only after connecting the power supply.

3.2 Feed Button

FEED button:

1) Pushing this button the printer feeds paper, however the FEED button is blocked during the following conditions:
   - Paper is end
   - Printer cover is open
2) If you push this button when the printer is in the macro execution standby state, the defined macro is executed instead of feeding paper.

3.3 LED

1) Power (POWER) LED: Green

   On: Power is on.

   Off: Power is off.

2) Error (ERROR) LED: Red

   Blinking: indicates one of the three states: Error, Self-test standby state or macro standby state.

The error LED and buzzer indicate the states of the printer, as described in the table below:

Errors	Voice of buzzer	LED flash
Cutter error (paper jam)	Long-short-long	Fast
Printer cover is open	Short-long-short	Slow
Print head is overheated (＊)	Long-short-long	Fast
Paper near end	No	Faster
Paper end	Short-short-short	Faster

Caution:

The printer can detect the temperature of the print head with thermal resistor. If

the temperature of the print head has increased too much, the printer will decrease its print speed. If the temperature becomes higher than 65℃, the protection circuit of the printer will force the printer to stop printing; at the same time the light and sound signals as described in the table will be given.

Self-test

1) The printer has a self-test function that checks the following:

- Control circuit functions
- Printer mechanisms
- Print quality
- Firmware version

2) Starting the self-test

Press down the FEED button while switching on the printer, the printer will start printing the configuration sheet. The contents of the self-test page vary according to current configuration of printer.

Before starting the self-test, make sure that a paper roll has been loaded and the top cover is closed.

Hexadecimal Dump

1) Hexadecimal dump mode

This function prints the data transmitted from the host computer in hexadecimal numbers and in its corresponding characters.

2) Entering the hexadecimal dump mode

Open the cover and turn the power on while pressing the FEED button or send a GS (A command, then close the cover. The printer first prints "Hexadecimal Dump To terminate …..". From this point on, all data received by the printer will be printed in hexadecimal numbers and in its corresponding characters.

NOTES:

(1) Non-printable characters will be printed as ".".

(2) In hexadecimal dump mode, all commands other than DLE EOT, DLE

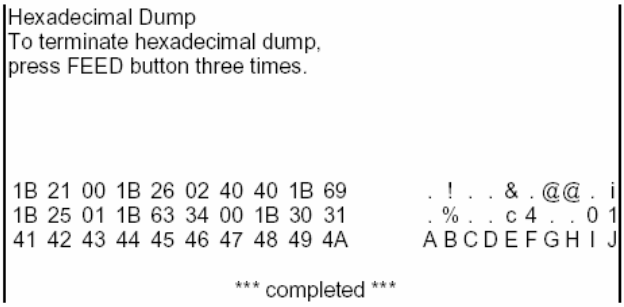
ENQ, and DLE DC4 are not executed.

(3) Insufficient print data to fill the last line can be printed by pressing the FEED button.

3) Ending hexadecimal dumping

Hexadecimal dump mode can be ended by turning off the power, or press the FEED button three times, or reset the printer after printing has finished.

< print sample in Hexadecimal Dump mode >


Hexadecimal Dump
To terminate hexadecimal dump,
press FEED button three times.
1B 21 00 1B 26 02 40 40 1B 69 . ! . . & . @@ . i
1B 25 01 1B 63 34 00 1B 30 31 . % . . c 4 . . 0 1
41 42 43 44 45 46 47 48 49 4A A B C D E F G H I J
*** completed ***

Specifications

6.1 General Specifications

1) Printing method: Direct line thermal printing

2) Dot density: 203 DPI(H) ×180 DPI(V)

3) Printing direction: Unidirectional with friction feed

4) Printing width (max): 80mm { 2.52 "}, 640 dot positions

5) Characters per line (default): Font A: 42
Font B: 56
Kanji: 21

6) Character spacing (default): Font A: 0.25 mm {0.01"} (2 dots)
Font B: 0.25 mm {0.01"} (2 dots)
Kanji: 0.125 mm {0.005"} (1 dot)
Programmable by command

7) Printing speed: 200 mm/s (Max) { 7.3"/s }
47.3 LPS maximum (4.23 mm/feed)

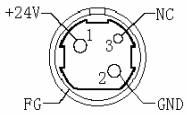
6.2 Auto Cutter Specifications

Item	Parameter	Remarks
Cutter type	Slide cutter (Guillotine type)	
Cutting time	600ms	The time that one cut takes.
Cutting interval	2s	30 times/min. (Max.)
Paper type	Thickness: 0.065 – 0.1mm	Thermal paper or paper with the same thickness
Operation voltage	24VDC	
Max. static current	1.2A	24V DC
Cutter lifetime	1,000,000 cuts (with reference paper)	Full cut or Partial cut

6.3 Interface

Serial Interface(RS232), Parallel Interface(IEEE1284), USB Interface, Ethernet Interface, WLAN.

6.4 Electric Parameters of the Power Supply

Item	Parameter
Supply voltage	24VDC±5%
Current consumption	Mean: approximately 2.5A (12.5% duty ratio) Peak: Approximately 8 A
Ripple & Noise	< 240mVp-p
Power Connector	1 --- Positive (+24V) 2 --- GND 3 --- NC. 

Caution:

Please use the power supply that is supplied with the printer or an equivalent type.

6.5 Environmental Conditions

1) Operating temperature and humidity: 5～45℃，20 ~ 80% RH
(No dew condensation)

2) Storage temperature and humidity：-40～55℃，≤93%RH (40℃)

6.6 Reliability

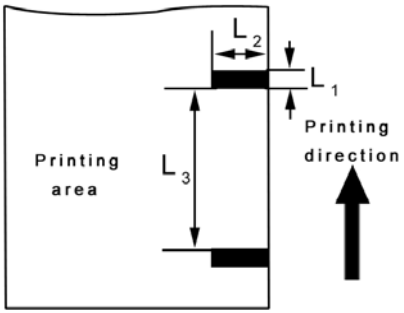
1) Life times:

Thermal head:	100,000,000 pulses, 100 km
Auto cutter:	1,000,000 cuts
2) MTBF:	360,000 hours
3) MCBF:	52,000,000 lines

6.7 Black Mark Specifications

Printer can work in the mark paper mode, and in accordance with mark to set cutting and the start print location. In addition to mark paper need to meet the specification for Thermal roll, should also meet the following requirements:

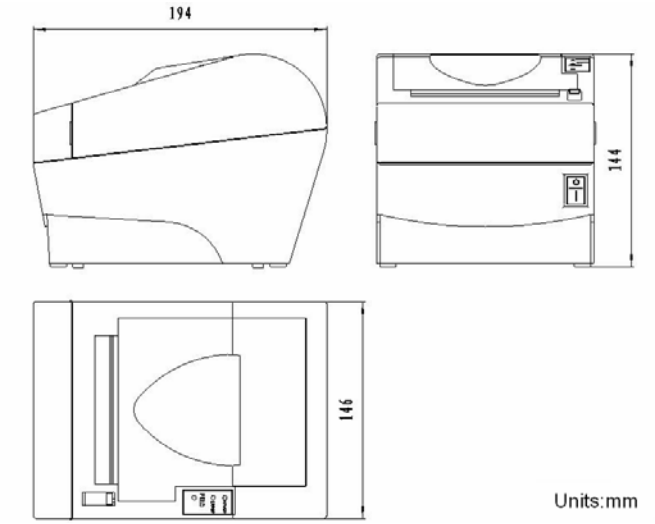
- L1 Mark height: 5mm≤L1≤10mm.
- L2 Mark length: L2≥12mm.
- L3 Mark spacing: 20mm≤L3<500mm.
- Mark location: Mark can be located in the left, middle and right (It is only suitable for 80mm paper rolls).
- Reflectivity: Mark's reflection rate should be less than 15%, some other reflectance should be greater than 85%. Marks in the area between, there should not be any patterns, such as advertising, posters, etc.



Note:

Marks were measured when printing or feeding. If the sensor detects the mark height is greater than that default sets (default mark height is 8mm), printer will report Paper end error.

6.8 Overall Dimension

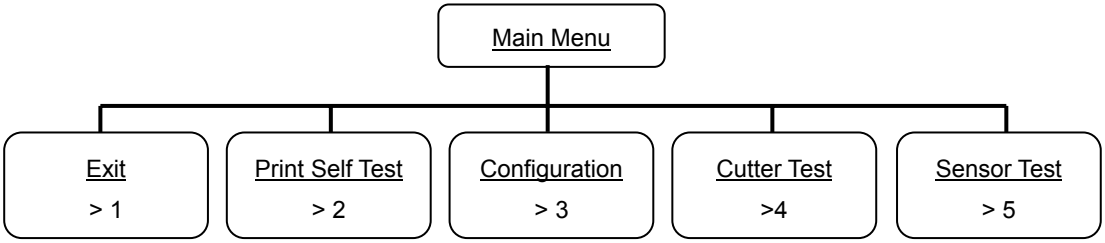


FEED Button Configuration

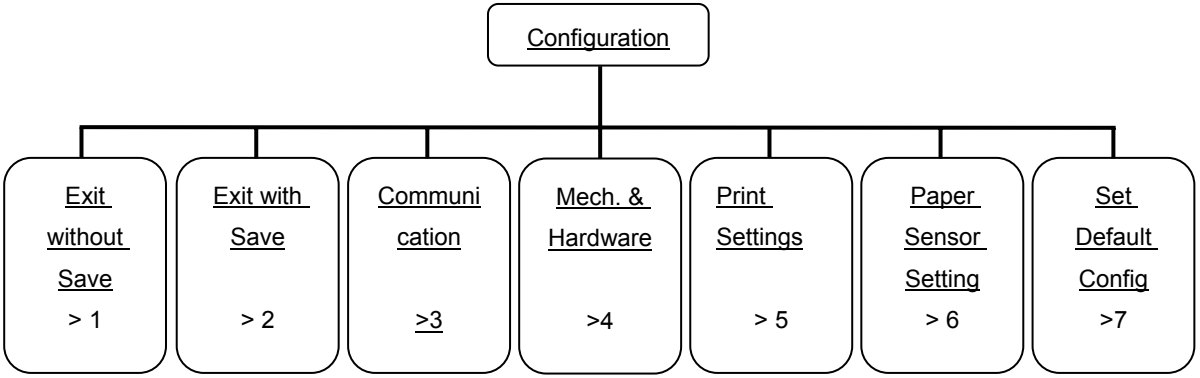
Parameter setting (configuring) by Feed button

1) Hold the FEED button pressed while switching the printer on.
2) After the printer has printed the configuration sheet, press and hold the FEED button to configure the printer. The main menu for the key-stroke setting procedure is printed.
3) The procedure consists of several sub-menus and step-by-step working is needed.
4) With every choice is a number. This number indicates the number of times the FEED button has to be shortly pressed. After this, the choice is validated by an additional, but longer press of the FEED button (1 sec).
5) After all settings have been done, they are stored in the printer by stepping back through the submenus to the main menu by using the number “1” plus additional press for validation.

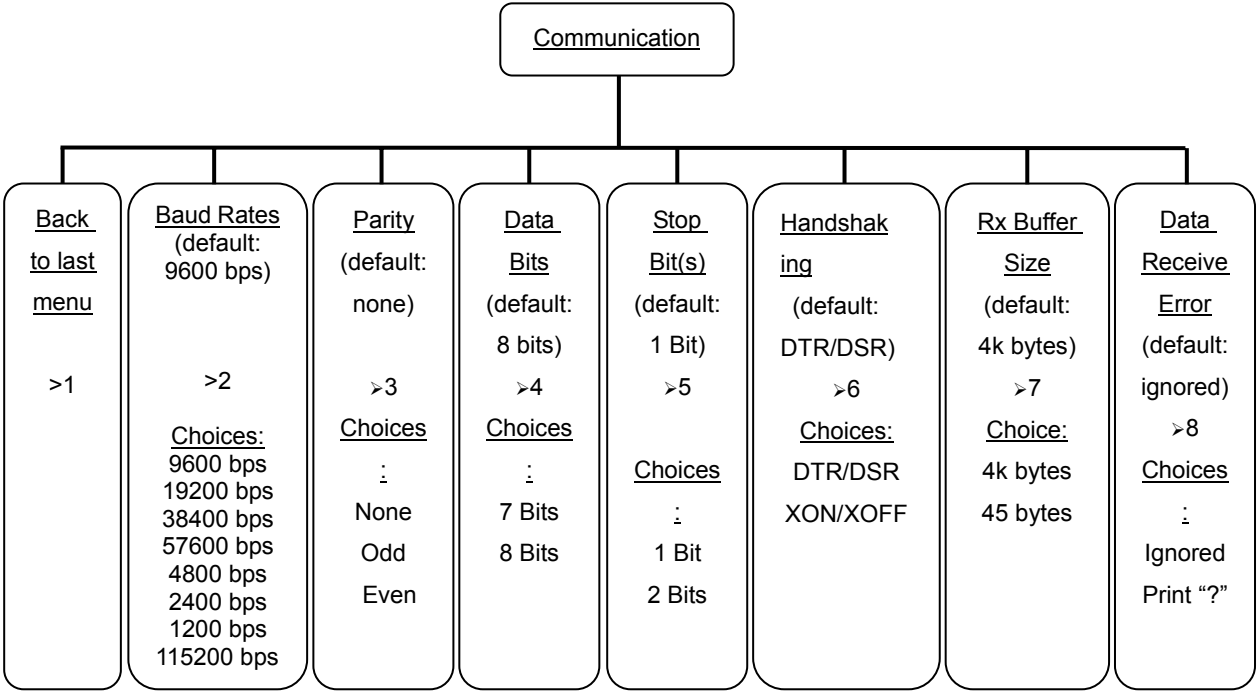
- **Parameter Setting by Feed Button**



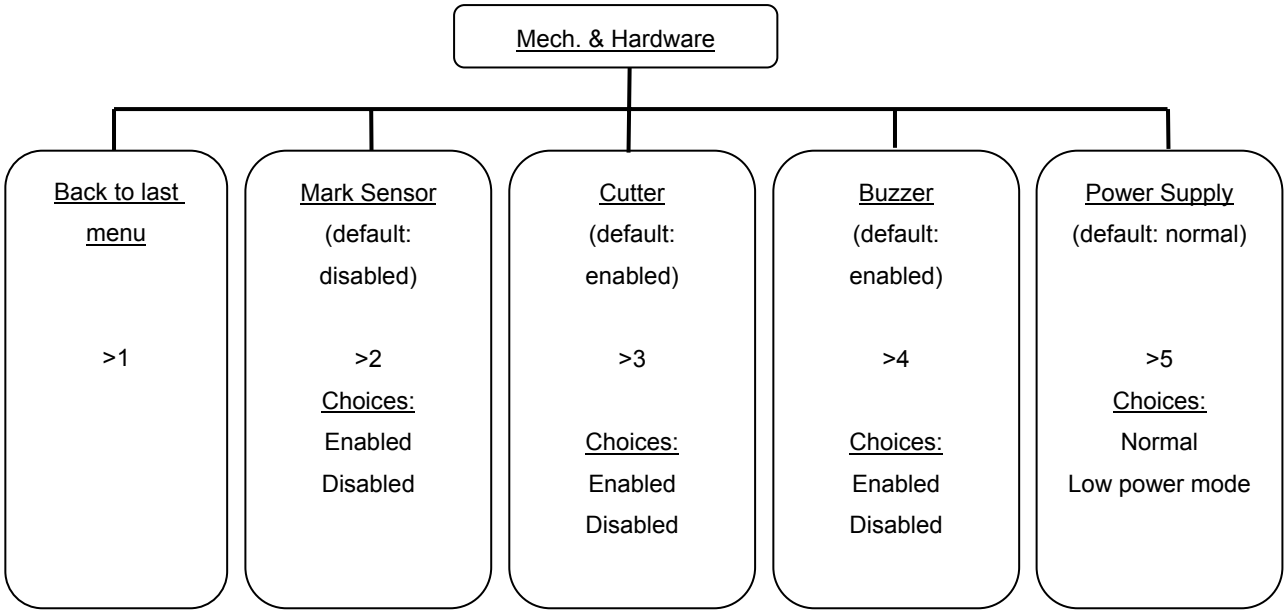
- **Setting Configuration of the Printer**



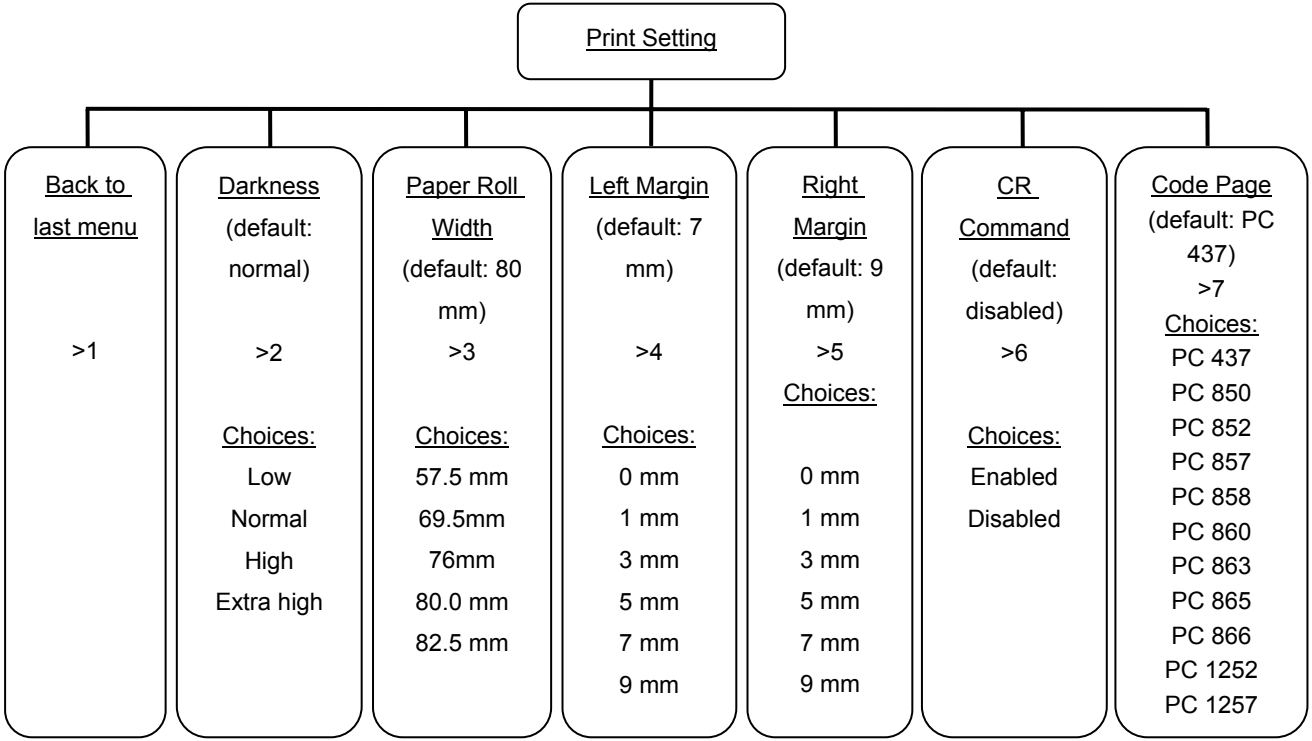
➢ Configuration of the Serial Interface



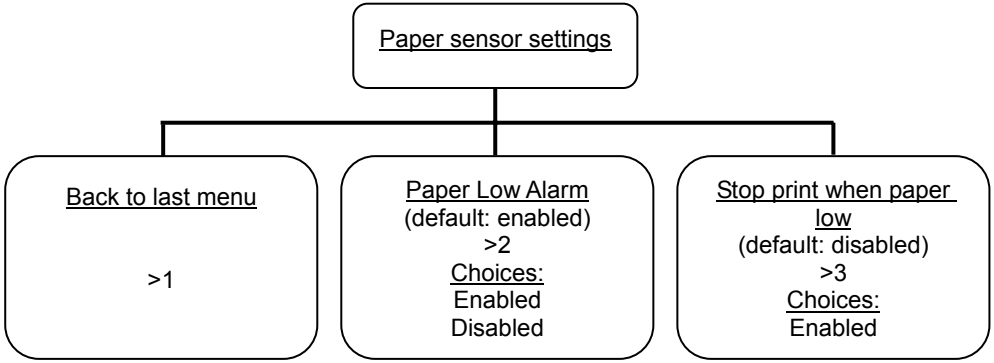
- **Setting Mechanism and Hardware**



- **Print Setting**



- **Paper Near-end Sensor setting**



- **Set Default Configuration**